

# Management of Ulnar Styloid Fractures Concomitant with Distal Radius Fractures: Case-Based Insights into the Decision between Fixation and Neglect

Hassan Zolghadr<sup>1</sup>, Hesam Alitalashi<sup>2,\*</sup>, Aysan Valinejad<sup>3</sup>

<sup>1</sup> Orthopedic Surgeon, Center for Orthopedic Trans-Disciplinary Applied Research, Tehran University of Medical Sciences, Tehran, Iran

<sup>2</sup> Assistant Professor, Department of Orthopedics and Trauma Surgery, Shariati Hospital, Tehran University of Medical Sciences, Tehran, Iran

<sup>3</sup> Student of Medicine, Center for Orthopedic Trans-Disciplinary Applied Research, Tehran University of Medical Sciences, Tehran, Iran

\*Corresponding author: Hesam Alitalashi; Department of Orthopedics and Trauma Surgery, Shariati Hospital, Tehran University of Medical Sciences, Tehran, Iran. Tel: +98-9112919654  
Email: hesam.alitalashi@gmail.com

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## Abstract

**Background:** Ulnar styloid fractures are frequently associated with distal radius fractures; however, their optimal management remains controversial. In particular, the necessity of fixation in relation to distal radioulnar joint (DRUJ) stability continues to be debated.

**Case Report:** This article presents three representative clinical scenarios alongside a focused review of the current literature regarding ulnar styloid fracture management. The discussion emphasizes intraoperative assessment of DRUJ stability and its role in guiding treatment decisions. Nonoperative management is generally appropriate for minimally displaced or tip fractures, whereas selective fixation may be considered in displaced basal fractures associated with DRUJ instability.

**Conclusion:** Management of ulnar styloid fractures should be individualized based on DRUJ stability rather than fracture union alone. Selective fixation in cases of true instability yields favorable outcomes, while routine fixation is not recommended. Nonunion of the ulnar styloid is often clinically insignificant, and avoidance of unnecessary surgical intervention may reduce complication rates.

**Keywords:** Joint Instability; Ulna; Fracture Fixation

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## Background

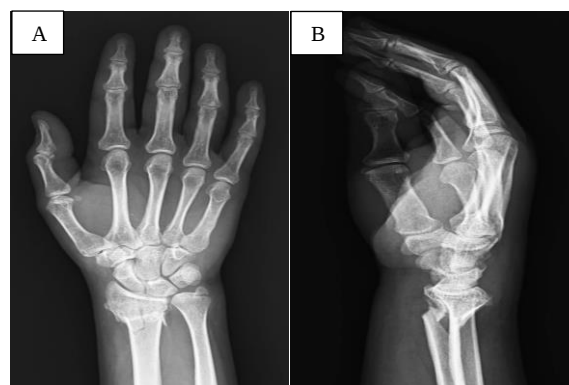
Ulnar styloid fractures are frequently encountered in association with distal radius fractures, accounting for a significant proportion of wrist injuries seen in clinical practice. Despite being a relatively common finding, their clinical relevance and optimal management strategy remain subjects of ongoing debate (1). The ulnar styloid plays an important role in maintaining the stability of the distal radioulnar joint (DRUJ) and the integrity of the triangular fibrocartilage complex (TFCC), both of which are essential for normal wrist biomechanics and function (2). Consequently, determining whether to fix or neglect these fractures continues to challenge orthopedic surgeons.

The controversy stems from inconsistent evidence regarding the functional outcomes of fixation. While some studies have reported that fixation of the ulnar styloid may promote bony union and improve DRUJ stability, others have shown no significant difference in functional results compared to conservative treatment (1-3). Moreover, surgical fixation carries its own set of potential complications, including hardware irritation, nonunion, and ulnar-sided wrist pain. Therefore, the management decision must balance the risks of intervention against the potential benefits of achieving joint stability.

Given these uncertainties, clinical decision-making often depends on the presence of DRUJ instability, fracture displacement, patient activity level, and surgeon experience. Real-world scenarios frequently involve gray zones where guidelines are unclear, and individualized judgment is required.

## Case Report

**Case 1:** A 42-year-old man presented with a distal radius fracture accompanied by an ulnar styloid fracture following a low-energy fall (Figure 1).



**Figure 1.** Preoperative anteroposterior (AP) (A) and lateral (B) radiographs

The distal radius was managed with open reduction and internal fixation (ORIF) using a volar locking plate (Figure 2).

Intraoperative assessment of the DRUJ demonstrated stable alignment and motion, and therefore, the ulnar styloid fragment was left untreated. Postoperative recovery was uneventful, with progressive rehabilitation leading to radiographic union of both fractures and restoration of full wrist function.

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Figure 2. Postoperative anteroposterior (AP) (A) and lateral (B) radiographs

At the final follow-up, the patient reported no pain, and objective assessment confirmed normal range of motion (ROM) and grip strength (Figure 3).



Figure 3. Final anteroposterior (AP) (A) and lateral (B) radiographs

**Case 2:** A 56-year-old man sustained a distal radius fracture associated with ulnar styloid fracture after a fall (Figure 4).



Figure 4. Preoperative anteroposterior (AP) (A) and lateral (B) radiographs

The distal radius was managed with percutaneous pinning (PCP) and external fixation. Intraoperative evaluation revealed persistent DRUJ instability, which was stabilized using two transfixing Kirschner wires (K-wires) across the joint (Figure 5). The ulnar styloid fracture itself was not directly fixed.

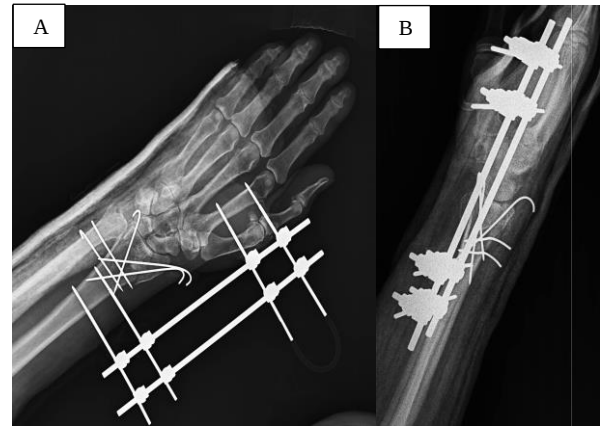


Figure 5. Postoperative anteroposterior (AP) (A) and lateral (B) radiographs

**Case 3:** A 17-year-old boy presented with a distal radius fracture and a displaced ulnar styloid fracture (Figure 6). Management consisted of closed reduction and PCP followed by cast immobilization.



Figure 6. Preoperative anteroposterior (AP) (A) and lateral (B) radiographs

Clinical assessment revealed a stable DRUJ, and despite radiographic evidence of displacement, the ulnar styloid fracture was managed nonoperatively (Figure 7).

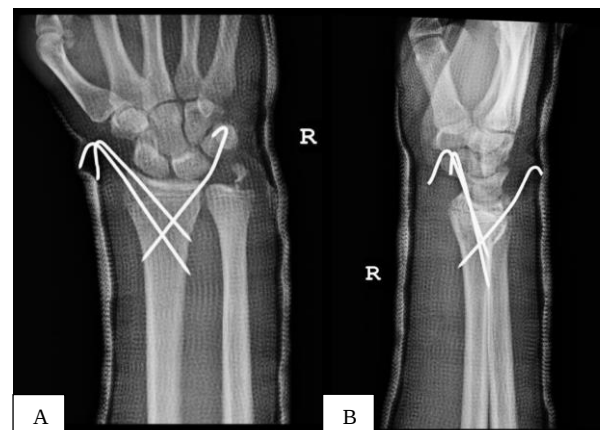


Figure 7. Postoperative anteroposterior (AP) (A) and lateral (B) radiographs

## Discussion

Several studies have investigated the clinical relevance

and management of ulnar styloid fractures associated with distal radius fractures. Velmurugesan et al. compared fixation versus conservative management of basal ulnar styloid fractures and found no overall difference in function, pain, or ROM, although nonunion was more frequent without fixation. Notably, displacement greater than 2 mm was associated with worse outcomes, highlighting the potential need for selective fixation in cases similar to Case 3 (2).

Zenke et al. evaluated 118 patients with distal radius fractures treated by volar plating, comparing those with and without concomitant ulnar styloid fractures. They reported no significant differences in radiological or functional outcomes between the groups. Nonunion of the styloid was common but did not correlate with ulnar-sided wrist pain or poor function, suggesting that fixation is unnecessary in most cases (4).

Kumar et al. performed a systematic review and meta-analysis including 336 patients from five comparative studies. While fixation of the ulnar styloid improved union rates, it did not enhance functional scores, ROM, or stability. Moreover, fixation was associated with higher rates of implant-related complications and ulnar-sided pain, supporting non-fixation in the majority of cases (1).

Mulders et al. conducted a meta-analysis of 12 studies, including 2243 patients with distal radius fractures, to compare outcomes with and without concomitant ulnar styloid fractures. They found no clinically meaningful differences in functional scores, pain, grip strength, ROM, or DRUJ stability. Additionally, the fracture level (base vs. non-base) did not influence outcomes, indicating that routine fixation is generally unnecessary (5).

Wijffels et al. analyzed comparative trials assessing ulnar styloid nonunion in distal radius fractures. Their findings revealed no significant association between nonunion and poor functional outcomes, pain, or DRUJ instability, reinforcing that fixation of the styloid solely to prevent nonunion is not required (6).

Cadaveric biomechanical studies have provided further insights. Maniglio et al. compared four fixation techniques for ulnar styloid fractures, finding that all methods improved translational stability; however, only K-wire fixation and tension band wiring (TBW) restored rotational stability of the DRUJ. TBW was biomechanically superior overall, though the clinical implications remain uncertain (7).

Pidgeon et al. demonstrated that ulnar styloid base fractures involving the fovea caused significant DRUJ rotational instability. Screw fixation partially restored pronation stability but did not fully correct supination instability, suggesting that large foveal fractures may require more robust fixation (8). Nakamura et al. further confirmed that tip and middle fractures produced minimal instability, whereas base-oblique fractures, especially those involving the fovea, resulted in substantial loss of dorsopalmar stiffness of the DRUJ. They concluded that large base fragments including the origin of the radioulnar ligament should be fixed, while smaller tip or middle pieces could generally be neglected (9).

Clinical outcome studies also support selective fixation. Sammer et al. prospectively followed 144 patients treated with volar plating for distal radius fractures, excluding those with DRUJ instability. They found that the presence, size, displacement, or nonunion of an associated ulnar styloid fracture did not predict Michigan Hand Outcomes Questionnaire (MHQ) scores, indicating that

ulnar styloid fractures do not affect subjective outcomes when the DRUJ is stable (10).

Logan and Lindau critically reviewed the literature on distal ulnar fractures, emphasizing their often underestimated clinical significance. They reported that base fractures displaced by more than 2 mm carried a risk of DRUJ instability and might require fixation, whereas tip fractures were generally stable. Symptomatic nonunions should be managed by fragment fixation or excision combined with ligament repair, although overall evidence remains limited (11).

Management of DRUJ instability following distal radius fixation remains controversial. In such cases, three treatment strategies are commonly considered: immobilization in a stable position, transfixation with K-wires, and fixation of the ulnar styloid fracture or TFCC repair. A meta-analysis by Xiao et al. demonstrated that each approach offered specific advantages. Patients treated with cast immobilization achieved greater ROM, while those who underwent K-wire stabilization exhibited superior grip strength. In contrast, patients who received TFCC repair showed comparatively lower functional outcomes. Ultimately, no significant differences were observed in Disabilities of the Arm, Shoulder, and Hand (DASH) scores among the three treatment groups (12).

### Conclusion

The consensus among experts emphasizes that the stability of the DRUJ is the paramount factor in guiding the management of ulnar styloid fractures. Displaced basal fractures may warrant fixation in selected cases, but if the DRUJ remains stable following distal radius fixation, additional intervention on the styloid is rarely necessary. Surgeons should be cautious of potential implant-related complications, including hardware irritation and ulnar-sided wrist pain.

Key pitfalls to avoid include assuming that fracture displacement alone mandates fixation, overlooking subtle DRUJ instability, and relying solely on radiographic findings without correlating them to clinical function.

Overall, routine fixation of ulnar styloid fractures is not indicated. Management should be individualized, guided by intraoperative assessment of DRUJ stability, fracture characteristics, and patient-specific factors. Importantly, union of the ulnar styloid does not necessarily correlate with improved functional outcomes. Prioritizing DRUJ stability and selective fixation can optimize results while minimizing unnecessary complications.

### Conflict of Interest

The authors declare no conflict of interest in this study.

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